

REMARKS

Applicants appreciate the Examiner's indication that dependent Claim 2 contains allowable subject matter, and would be allowed if rewritten to include the subject matter of its associated base claim and any intervening claims, and if the § 112 rejection could be overcome. Applicants have elected not to amend Claim 2 into independent form at this time because, for the reasons set forth below, Applicants believe that the subject matter of independent base Claim 15 is allowable even without the subject matter of Claim 2.

Claims 15, 1-8 and 16 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicants respectfully traverse this rejection.

The Examiner questioned the meaning of the term "maximum resistance change rate" and the term "maximum resistance change amount." In response, Applicants respectfully submit that the following definitions of these terms are well known to those of ordinary skill in the art. The "maximum resistance change rate" is arrived at by the following formula: $(\text{maximum resistance} - \text{minimum resistance}) / (\text{minimum resistance}) \times 100 \%$. The "maximum resistance change amount" is the maximum resistance minus the minimum resistance.

Additionally, the Examiner also appears confused by the use of the terms "current perpendicular to the plane structure" (CPP) and the phrase "current in an in-plane direction" in Claim 15. Claim 15 does not recite that the sensor has both a CPP structure and

a CIP (“current in plane”) structure. Instead, this claim recites that the sensor has a CPP structure, but the thickness of the magnetoresistive film is selected to be larger than that providing the maximum resistance change rate or the maximum resistance change amount when passing a current in the in-plane direction (as if it were a CIP structure).

Accordingly, Applicants respectfully submit that the language of Claim 15 is clear, and withdrawal of this §112, second paragraph, rejection is respectfully requested.

Claims 15, 1, 3, 6, 7 and 16 stand rejected under 35 U.S.C. § 102 (b) as being anticipated by United States Patent No. 5,668,688 to Dykes et al. Applicants respectfully traverse this rejection.

Applicants respectfully submit that the Dykes et al. reference fails to disclose all of the features of the present invention. More specifically, the Dykes et al. reference fails to disclose a magnetoresistive sensor with a CPP structure where the “magnetoresistive film has a thickness larger than that providing a maximum resistance change rate or resistance change amount in the case of passing a current in an in-plane direction,” as defined in independent Claim 15. Applicants agree that the Dykes et al. reference discloses a sensor with a CPP structure. Applicants also agree that the Dykes et al. reference mentions CIP structures (when discussing prior art devices). However, the Dykes et al. reference fails to disclose the magnetoresistive film thickness range defined in independent Claim 15. More specifically, the Dykes et al. reference fails to disclose that the magnetoresistive (MR) film, of this CPP structure, is of “a thickness larger than that providing a maximum resistance

change rate or resistance change amount in the case of passing a current in an in-plane direction” (i.e., the thickness is larger than it would be if the claimed CPP structure were a CIP structure with the thickness that provides the maximum resistance change rate or resistance change amount). In a CIP structure, it is necessary to reduce the thickness of the MR film so that it is as thin as possible in order to reduce current loss. In the claimed invention, however, the maximum resistance change rate or maximum resistance change is increased by making the MR film thicker because the current is passed perpendicular to the plane (i.e., the present invention is a CPP structure). Accordingly, as all of the features of Claim 15 are not disclosed in the Dykes et al. reference, Applicants respectfully request the withdrawal of this §102(b) rejection of independent Claim 15 and associated dependent Claims 1, 3, 6, 7 and 16.

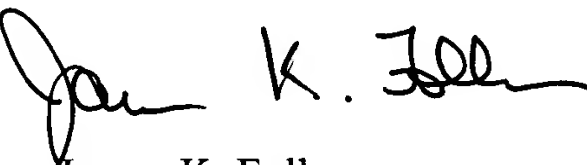
Claims 4, 5, and 8 stand rejected under 35 U.S.C. § 103 as being unpatentable over Dykes et al. in view of United States Patent No. 6,38,859 to Gill. Applicants respectfully traverse this rejection.

Claims 4, 5, and 8 all depend, directly or indirectly, from independent Claim 15, and therefore include all of the features of Claim 15, plus additional features. Accordingly, Applicants respectfully request that the § 103 rejection of dependent Claims 4, 5, and 8 under Dykes et al. and Gill be withdrawn considering the above remarks directed to independent Claim 15, and also because the Gill reference does not remedy the deficiency discussed above.

For all of the above reasons, Applicants request reconsideration and allowance of the claimed invention. Should the Examiner be of the opinion that a telephone conference would aid in the prosecution of the application, or that outstanding issues exist, the Examiner is invited to contact the undersigned.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By 
James K. Folker
Registration No. 37,538

June 13, 2005

Suite 2500
300 South Wacker Drive
Chicago, Illinois 60606
(312) 360-0080

Customer No. 24978
P:\DOCS\3531\65364\970755.DOC